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CONSTRUCTION OF THE MIXER USED IN THE SEDIMENTATION TEST

Materials needed:

Clear straight grained wood:

1/2" x 2"	—	2'
3/4" x 2"	--	8-1/2'
2" x 4"	--	3'

Nails:

6-penny, rosin-coated, box	12
8 " " " "	10
8 " finish	6
16 " common	2

Screws — round head 5/8"	2
" " 1"	2

Bolts and nuts 1/8" diameter x 1/2"	4
1/8" " x 1-1/4"	1
1/8" " x 1-3/4"	2

Washers to fit bolts	3
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Bushings, 1/8" i.d, 1/4" o.d. x 13/16"	2
1/8" i.d, 3/16" o.d. x 1/8"	1

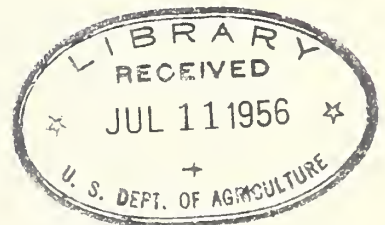
Wire saddle staples 1/2"	11
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Sheet metal .05" thick 5" x 7"	1
3-1/2" x 5"	1

#4 rubber stoppers	8
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1/8" or 3/16" steel spring, tight coil (sash curtain spring)	2
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Motor — 1/100 H.P. geared — 1750 R.P.M. shaded pole induction — drive shaft turns 40 R.P.M. — fitted with crank, 1" throw.
(Merkle-Korff Gear Co., 213 N. Morgan Street, Chicago 7,
will supply a motor of these specifications for less than \$15.
To order this motor refer to order number F 18346. April 8, 1955.
The motor is described as "Flexo-Action SGL5 110/60cy 40 RPM
Either." Specify also the 1" crank.



Parts — description and construction:

A and B. — rack ends

From the ends of 2 rectangular pieces $1/2" \times 2" \times 11-1/2"$ cut triangular pieces $2" \times 0" \times 3/16"$; forming parallelograms, $2" \times 11-5/16"$. Drill $1/8"$ holes $3/8"$ from the upper edge and $5-1/4"$ from the D end. (See diagram). Drill also in B a $1/8"$ hole exactly $2"$ from the first hole and $3/8"$ from the edge. (These holes are for the rack pivots and wrist pin, respectively, and the $2"$ spacing determines the degree of oscillation of the rack, hence should be precise)

C. Cross member carrying the stopper guards

$3/4" \times 2" \times 23-1/2"$ Make 8 holes, $1"$ diameter, $2-3/4"$ center to center, $2-1/8"$ center to end. A groove $1/8"$ deep and $3/16"$ wide is cut along the center line of one face.

D. Cylinder base rest $3/4" \times 1-1/4" \times 23-1/2"$

E and F cylinder supports.

In a piece $3/4" \times 2" \times 22-1/2"$ cut eight $1-3/16"$ holes, $2-3/4"$ between centers as in C, $1-5/8"$ center to end. Cut through the center line (dotted).

G. Sheet metal brace for D (not essential)

H. #4 rubber stopper. Drill $1/8"$ holes through each stopper $7/8"$ from large end.

I and J. Rack supports $3/4" \times 1-1/2" \times 12"$ Drill $1/4"$ hole through face of each at center, $3/4"$ from the top. Bevel the top.

K. Cross-bar of T-frame. Cut triangles from the upper corners of a rectangular piece $1-1/2" \times 3-1/2" \times 14"$ so that the piece remaining is a regular trapezoid:

L. Stem of T-frame — $1\frac{1}{2}$ " x $3\frac{1}{2}$ " x 22"

The combined thickness of K and length of L should be $23\frac{1}{2}$ "

M. Sheet metal cover for motor, 5" x 7" Bend at right angle,
2" of one end: drill ~~two~~ $\frac{1}{8}$ " holes in other end.

N. Metal connecting rod $\frac{1}{8}$ " x $\frac{1}{2}$ " x $9\frac{3}{4}$ ". Drill a $\frac{1}{8}$ " hole
through center $\frac{1}{4}$ " from one end and a $\frac{3}{16}$ " hole $\frac{1}{4}$ " from the
other end.

Motor — attached to rear face of L, under M.

Assembly:

(All moving parts should be carefully fitted before assembling.)

Attach C to A and B with 3-8 penny box nails for each joint.
Drill a small leader hole for each nail.

Attach D to A and B, lower edges flush, 2 nails for each joint.
(It is safer to clamp the ends of A and B in a vise while nailing.)

Cut the 6-penny box nails to $1\frac{1}{2}$ " length and re-point.
Use these in attaching E and F in positions shown in the
diagram of A and B. Thread the steel spring through the
8 rubber stoppers. Stretch the spring taut with the stoppers
properly positioned and fasten the ends of the spring with
staples driven into the ends of C. Clamp the spring to C
midway between the stoppers with saddle staples. The
stoppers should slide easily in the holes. In operation,
the rubber stoppers press firmly against the glass stoppers
of the graduate cylinders used in the test.

(In the illustration, D is made of $\frac{3}{8}$ " stock and G was necessary.
With $\frac{3}{4}$ " stock, it is not required)

Attach L to the center of K, with 2-16 penny nails, forming a T.
 $\frac{1}{2}$ " rubber pads should be fastened under the ends of K
and the outer end of L.

Fasten I and J to K and L, respectively, with 3 finish nails
each. The distance between I and J should be slightly more
than the length of the rack. Place the $\frac{1}{4}$ " bushings in the
 $\frac{1}{4}$ " holes in I and J.

Put the rack in position with washers between the rack ends and the bushings. Push the $1/8"$ x $1-3/4"$ bolts through A and B and the washers and bushings. Clamp the bushings tightly with the nuts. If the parts are properly fitted, the rack should now turn easily and smoothly. It should remain in a horizontal position when released. If it does not, attach a metal strap of the proper weight to the under side of C or D as a counter-weight.

Push the $1/8"$ x $1-1/4"$ bolt through the second hole in B, put on a washer and a nut. Tighten the nut. Put on the $1/8"$ bushing and the connecting rod, then another nut and tighten. The bushing must be slightly longer than the thickness of the rod, which should turn freely. Attach the $3-1/2"$ x $5"$ plate to the base of the motor with four $1/2"$ bolts so that approximately $2"$ of the plate is left on either side of the motor. Drill a $3/16"$ hole near each end of the plate about midway between the sides. Fit the connecting rod to the motor-crank by placing on the crank first a washer, then the connecting rod and then another washer. Drill a $1/16"$ hole through the crank pin just clear of the second washer and fit it with a $1/2"$ piece of steel wire. Bend the ends of the wire around the crank pin. Fasten the plate with the motor attached, to the rear face of L with two $5/8"$ screws, so that the connecting rod moves in a plane parallel to J. Adjust the position of the motor so that the rack oscillates 30° each side of the horizontal position.

Place a wood block $1/2"$ x $1-1/2"$ x $4-1/2"$ on top of L next to J, then attach M with two $1"$ screws so that it protects the motor from cylinder leakage.

The motor-cord may be led out over L under M.

